more than 0.015% in mass % as the contents of alloying elements with the rest consisting of Fe and unavoidable impurities and having a structure subjected to tempering after quench hardening or carbonitriding, wherein the hardness after said tempering is at least HRC 58, when tempered at a temperature in a range of 180°C to 350°C, and the maximum carbide size is not more than 8 μm.

REMARKS

Claims 1 and 2 are pending in this application. In response to the Office Action dated January 9, 2002, claim 1 has been amended. Care has been exercised to avoid the introduction or new matter. Indeed, adequate descriptive support for the present Amendment should be apparent throughout the originally filed disclosure as, for example, Table I appearing at page 11 of the written description of the specification. Applicants submit that the present Amendment does not generate any new matter issue.

A clean copy of amended claim 1 appears in the Appendix hereto.

Claims 1 and 2 were rejected under 35 U.S.C. §103 for obviousness predicated upon Nakamura et al. in view of the acknowledged prior art (page 2 of the written description of the specification, lines 7 through 12).

This rejection is traversed as factually and legally erroneous.

The Examiner's Position

In the exposition of the rejection, the Examiner asserted that Nakamura et al. disclose a bearing steel containing elements and amounts which overlap the ranges

expressed in claim 1. The Examiner initially asserted that one having ordinary skill in the art would have expected that the steel disclosed by Nakamura et al. could be employed as antifriction bearing. The Examiner then concluded that one having ordinary skill in the art would have been motivated to temper the steel disclosed by Nakamura et al. within a range of 180° to 350°C, because of the conventionality of high temperature tempering of a bearing steel, as revealed on page 2 of the written description, lines 7 through 12. Then the Examiner stated that the resulting tempered steel would exhibit the properties recited in the claims. As pointed out above, Applicants traverse the rejection as factually and legally erroneous.

Insufficient Facts

The Examiner's rejection is premised, in part, upon an unsupported assertion. Specifically, the Examiner asserted that one having ordinary skill in the art would have recognized that the steel disclosed by Nakamura et al. would be suitable for use as an antifriction bearing, particularly for high temperature use. The Examiner is hereby questioned as to where in the prior art is the factual basis for that **assumption**? *In re Lee, __F.3d__, 51 USPQ2d 1430 (Fed. Cir. 2002).*

There is no Motivation

The Examiner concluded that one having ordinary skill in the art would have been motivated to temper the steel disclosed by Nakamura et al. within a range of 180° to 350°C. Implicit in that conclusion is the factual determination that one having ordinary skill in the art would have recognized that the steel disclosed by Nakamura et al. is

designed to function as a high temperature bearing. However, the Examiner has not provided any **facts** to support that determination. *In re Lee, supra.*

The Court of Appeals for the Federal Circuit has consistently held that in order to establish the requisite realistic motivation, the Examiner must make "clear and particular" factual findings as to a specific understanding or specific technological principle which would realistically impelled one having ordinary skill in the art to modify particular prior art (the steel disclosed by Nakamura et al.) to arrive at the claimed invention based upon facts--not generalizations or assumptions. *Ruiz v. A.B. Chance Co., 234 F.3d 654, 57 USPQ2d 1161 (Fed. Cir. 2000); Ecolochem Inc. v. Southern California Edison, Co. 227 F.3d 1361, 56 USPQ2d 1065 (Fed. Cir. 2000); In re Kotzab, 217 F.3d 1365, 55 USPQ 1313 (Fed. Cir. 2000); In re Dembiczak, 175 F.3d 994, 50 USPQ2d 1614 (Fed. Cir. 1999).* Based upon such facts, the Examiner must then explain **why** one having ordinary skill in the art would have been realistically led to temper the steel disclosed by Nakamura et al. at an elevated temperature of 180°C to 350°C. *Ecolochem Inc. v. Southern California Edison, Co. supra; In re Rouffet, 149 F.3d 1350, 47 USPQ2d 1453 (Fed. Cir. 1998).* That burden has **not** been discharged.

Again, the Examiner has **not** provided a "thorough and searching" factual inquiry as to whether to modify the processing disclosed by Nakamura et al. and temper at an elevated temperature of 180°C to 350°C. *In re Lee, supra.*

The Examiner's reliance upon Applicants' disclosure is misplaced. Specifically, the recitation at page 2 of the specification, of the written description of the specification, line 7 through 12, upon which the Examiner relies, happens to relate to a **high temperature bearing which is neither disclosed nor suggested by Nakamura et al**. In

this respect, Applicants submit that one having ordinary skill in the art would have understood that in order for a steel to function as a high temperature bearing part, it must exhibit hardness at an elevated temperature. It is, therefore, necessary to incorporate a high amount of carbon in the steel. Independent claim 1 specifies a carbon content of **at least 0.8%** which is above the maximum carbon content disclosed by Nakamura et al.

Applicants submit that one having ordinary skill in the art would **not** have considered the steel disclosed by Nakamura et al. suitable for use as a high temperature bearing, because of its carbon content. This being the case, one having ordinary skill in the art would **not** have realistically resorted to a high temperature tempering treatment, as disclosed in the written description of the present specification, in order to temper the steel disclosed by Nakamura et al. which is, manifestly, not designed for high temperature service. Indeed, as pointed out in the responsive Amendment submitted November 8, 2001, the tempering temperature employed in the embodiments disclosed by Nakamura et al. is 150°C. Nakamura et al. give no hint whether a hardness of HRC 58 or higher can be obtained at a temperature of 180° or higher.

It is, therefore, apparent that the Examiner has **not** established the requisite motivation with the requisite "convincing discussion of the specific sources of the motivation to combine the prior art references" as judicially required. *Ecolochem Inc. v. Southern California Edison, Co. supra at 56 USPQ2d 1075.*

Obviousness is not Inherency

The Examiner's position appears to be that **if** somehow one having ordinary skill in the art would have tempered the steel disclosed by Nakamura et al. at a high

temperature designed for high temperature bearing use, even though the steel disclosed by Nakamura et al. is manifestly not designed for high temperature use, **then** the claimed invention would result. This apparent reliance upon inherency is **legally erroneous for at least two reasons.**

Firstly, within the disclosed compositional ranges, each alloying element must be selected in order to achieve the properties recited in the claim. Ergo, the Examiner's apparent reliance upon inherency is legally erroneous in that it lacks the requisite **certainty.** *Finnegan Corp. v. ITC, 180 F.3d 1354, 51 USPQ2d 1001 (Fed. Cir. 1999); In re Robertson, 169 F.3d 743, 49 USPQ2d 1949 (Fed. Cir. 1999).*

Secondly, the approach adopted by the Examiner, i.e., **if** the steel disclosed by Nakamura et al. is heat treated in accordance with practices designed for high temperature bearing use, **then**, the claimed invention would result, has been repeatedly judicially condemned as **confusing obviousness with inherency**. *In re Rijckaert, 9 F.3d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993); In re Shetty, 566 F.2d 81, 195 USPQ 753 (CCPA 1977); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976).* As held by the Honorable Board of Patent Appeals and Interferences in *Ex parte Schricker, 56 USPQ2d 1723, 1725 (BPAI 2000):*

> Inherency and obvious are somewhat like oil and water-they do not mix well.

Evidence of Nonobviousness

The **problem** addressed and solved by a claimed invention must be given consideration in resolving the ultimate legal conclusion of obviousness under 35 U.S.C. §103. *North American Vaccine, Inc. v. American Cyanamid Co., 7 F.3d 1571, 28*

USPQ2d 1333 (Fed. Cir. 1993); Northern Telecom, Inc. v. Datapoint Corp., 908 F.2d 931, 15 USPQ2d 1321 (Fed. Cir. 1990); In re Newell, 891 F.2d 899, 13 USPQ2d 1248 (Fed. Cir. 1989); In re Nomiya, 509 F.2d 566, 184 USPQ 607 (CCPA 1975). In this respect, Applicants would note that the present invention addresses and solves problems, with bearings at **high temperatures**, which problems are **not** even on the radar screen of Nakamura et al. In accordance with the present invention, as disclosed throughout the written description of the specification, high temperature tempering is performed to ensure **dimensional stability**. Significantly high temperature tempering disadvantageously generates problems, such as lower hardness and shortening of bearing life. These problems do **not** exist for and are not addressed by Nakamura et al. Applicants, however, address and solve such problems by strategically **formulating** the claimed composition and employing certain processing conditions, thereby enabling the manufacture of a high temperature bearing part exhibiting higher dimensional stability and sufficient hardness. The achievement of such a combination of conflicting objectives is **not** even on the radar screen of Nakamura et al. Under such circumstances, the problem addressed and solved by the claimed invention is entitled to consideration as a potent indicium of **nonobviounsess**.

Moreover, it is well settled that **evidence in the specification** must be given consideration anent the **nonobviousness** issue. *In re Soni, 54 F.3d 746, 34 USPQ2d 1685 (Fed. Cir. 1995); In re Margolis, 785 F.2d 1029, 228 USPQ 940 (Fed. Cir. 1986).* In this respect, Applicants would again invite the Examiner's attention to the data appearing in **Tables 1 and 3** which demonstrate the functional significance of various alloying elements on the properties of the steel. For example, it is apparent that elements such as

nickel, sulfur, phosphorous, maganese, carbon, molydenum, vanadium as well as trace amounts of aluminum, titanium, oxygen and nitrogen, **impact** the temper hardness and rolling contact fatigue life. Such evidence clearly **undermines** any notion that somehow the combined disclosures would result in a steel which **necessarily** exhibits a hardness after tempering at a temperature of 180°C to about 350°C of at least HRC 58, or a maximum carbide size not greater than 8μm.

Conclusion

Based upon the foregoing, Applicants submit that the Examiner did **not** establish a prima facie basis to deny patentability to the claimed invention under 35 U.S.C. §103 for lack of the requisite factual basis and want of the requisite realistic motivation. Moreover, the Examiner's reliance upon the doctrine of inherency is replaced for lack of the requisite certainty and for manifestly confusing obviousness with inherency. Moreover, upon giving due consideration to the problem addressed and solved by the claimed invention and the evidence in the specification, the conclusion appears inescapable that one having ordinary skill in the art would **not** have found the claimed invention **as a whole** obvious within the meaning of 35 U.S.C. §103. *In re Piasecki, 745 F.2d 1468, 223 USPQ 785 (Fed. Cir. 1984).*

Applicants, therefore, submit that the imposed rejection of claims 1 and 2 under 35 U.S.C. §103 for obviousness predicated upon Nakamura et al. in view of the acknowledged prior art is not factually or legally viable and, hence, solicit withdrawal.

Claims 1 and 2 were rejected under 35 U.S.C. §103 for obviousness predicated upon Takata et al. in view of Ochi et al. and the acknowledged prior art (page of the written description of the specification, lines 7 through 12).

This rejection is traversed as factually and legally erroneous.

The Examiner's Position

In stating the rejection, the Examiner concluded that one having ordinary skill in the art would have been motivated to incorporate nickel in the steel disclosed by Takata et al. in view of Ochi et al. The Examiner then asserted that one having ordinary skill in the art would have expected that the steel resulting from the combined disclosures of Takata et al. and Ochi et al. could be employed as an antifriction bearing. The Examiner then went further and concluded that one having ordinary skill in the art would have been motivated to temper the steel resulting from the combined disclosures of Takata et al. and Ochi et al. at an elevated temperature in view of the perceived admission at page 2 of the written description of the specification, lines 7 through 12. The Examiner then ultimately concluded that after such transformation motivations of the steel disclosed by Takata et al., the properties recited in the claims would be obtained. Again, This rejection is traversed as factually and legally erroneous.

Insufficient Facts

The Examiner has failed to factually establish that one having ordinary skill in the art would have recognized that either the steel disclosed by Takata et al. or the steel disclosed by Ochi et al. is suitable for high temperature service. The mere disclosed use

for industrial machinery or in vehicles does **not denote high temperature bearing use**. Bearings can be employed in automobiles in components which do not involve high temperatures. The bottom line is that the Examiner has **not** factually established that one having ordinary skill in the art would have recognized that the steel disclosed by either Takata et al. or Ochi et al. is suitable for high temperature bearing use. *In re Lee, supra.*

Further, Applicants would note that in order to function effectively as a high temperature bearing part, it is necessary to incorporate nickel. As admitted by the Examiner, the steel disclosed by Takata et al. does **not** contain nickel. Thus, it is clear that one having ordinary skill in the art would have recognized that the steel disclosed by Takata et al. is **not** intended or suitable for high temperature bearing service.

There is No Motivation

As previously argued, the Examiner is required to make "clear and particular factual findings as to a specific understanding or specific technological principle which would have realistically impelled one having ordinary skill in the art to modify a particular prior art (the steel disclosed by Takata et al.) to arrive at the claimed invention based upon facts--not generalizations. *Ruiz v. A.B. Chance Co., supra.; Ecolochem Inc. v. Southern California Edison, Co. supra; In re Kotzab, supra; In re Dembiczak, supra.* The Examiner is also required to explain **why** one having ordinary skill in the art would have been realistically impelled to first add nickel to the steel disclosed by Takata et al. and then to temper an elevated temperature designed for high temperature bearing use. *In re Rouffet, supra.*

As previously pointed out, the Examiner failed to provide the requisite factual basis to support the determination that either the steel disclosed by Takata et al. or the steel disclosed by Ochi et al. would have been recognized by one having ordinary skill in the art as suitable for high temperature bearing use. This being the case, it defies logic to say that one having ordinary skill in the art would somehow have mixed and matched ingredients from the steel disclosed by Takata et al. and Ochi et al. to conjure up a steel which neither of them disclose, and then to apply a high temperature tempering treatment. *In re Lee, supra.* Applicants would stress that Takata et al. give no clue whether a hardness of HRC 58 can be obtained by tempering at a temperature of 180°C or higher.

Applicants again stress that the recitation on page 2 of the written description of the specification, lines 7 through 12, relates to high temperature bearing use. The Examiner has **not** factually established that either of the references to Takata et al. or Ochi et al. disclose or suggest a steel suitable for high temperature bearing use. Again, the Examiner has failed to provide any factual basis upon which to predicate the inclusion that one having ordinary skill in the art would have been realistically motivated to modify and then subject the steel disclosed by Takata et al. to high temperature tempering treatment designed for high temperature bearings. *In re Lee, supra.*

The Examiner's Reliance Upon Inherency is legally erroneous.

As previously pointed out, the resulting properties not only stem from high temperature treatment but from the appropriate selection of elements within the disclosed

ranges. Ergo, any reliance upon inherency is legally erroneous for lack of **certainty**. *Finnegan Corp. v. ITC, supra; In re Robertston, supra.*

Moreover, the Examiner's approach **if** nickel is added to the steel disclosed by Takata et al. and **if** the resulting steel is then treated at a high temperature, **then** properties recited in the claims would be achieved, is **legally erroneous** in that it confuses obviousness with inherency. *Ex parte Schricker, supra.; In re Rijckaert, supra; In re Shetty, supra; In re Reinhart, supra.*

Evidence of Nonobviousness

As previously argued, the present invention addresses and solves problems encountered with bearing parts at high temperatures, which problems are of no concern to either Takata et al. or Ochi et al. Further, the **evidence in the specification**, notably the data appearing in Tables 1 and 3, demonstrate the functional significance of various alloying elements on the properties of the steel. Such evidence undermines any notion that somehow the combined disclosures of Takata et al. and Ochi et al. would **necessarily** result in a steel which exhibits hardness after tempering at a temperature of 180° to 350°C of at least 8 HRC 58, or a maximum carbide grain size not greater than 8 μm.

Conclusion

It should, therefore, be apparent that a prima facie basis to deny patentability to the claimed invention under 35 U.S.C. §103 has not been established for lack of the requisite factual basis and want of the requisite realistic motivation. Moreover, the Examiner's reliance upon the doctrine of inherency is legally erroneous in that it lacks he

requisite certainty and confuses obviousness with inherency. Moreover, upon giving due consideration to the problem addressed and solved by the claimed invention and the objective evidence in the specification, the conclusion appears inescapable that one having ordinary skill in the art would **not** have found the claimed invention **as a whole** obvious within the meaning of 35 U.S.C. §103. *In re Piasecki, supra.*

Applicants, therefore, submit that the imposed rejection of claims 1 and 2 under 35 U.S.C. §103 for obviousness predicated upon Takata et al. in view of Ochi et al. and the acknowledged prior art is not factually or legally viable and, hence, solicit withdrawal thereof.

It should, therefore, be apparent that the imposed rejections have been overcome and that all pending claims are condition for immediate allowance. Favorable consideration is, therefore, respectfully solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this

paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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